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First record of a stranded Gervais' beaked whale,
Mesoplodon europaeus (Gervais, 1855),
in the Mediterranean waters

Abstract - This paper reports the first Mediterranean stranding of a Gervais' beaked whale (*Mesoplodon europaeus*) that took place in 2001 along the northern Tyrrhenian coasts of Italy. The specimen was an adult female. The skeleton is presently part of the collections of the Museum of Natural History of Milan. Species diagnosis was made based on measurements of the skull and mandible, review of the literature and comparison with other specimens of beaked whales belonging to several species maintained in consulting Institutions. To the best of the Authors' knowledge, this is the first report of a *Mesoplodon europaeus* in the Mediterranean waters.

Key words: Cetacea, Gervais' beaked whale, *Mesoplodon europaeus*, Ziphiidae, Mediterranean Sea, Italy, strandings.

Riassunto - Prima segnalazione dello spiaggiamento di un mesoplodonte di Gervais, *Mesoplodon europaeus* (Gervais, 1855), sulle coste del Mediterraneo.

Gli autori descrivono il primo ritrovamento di un mesoplodonte di Gervais (*Mesoplodon europaeus*) lungo le coste del Mediterraneo. Lo spiaggiamento è avvenuto nel 2001 sulle coste della Toscana (Tirreno settentrionale). L'esemplare era una femmina adulta di 4,5 metri di lunghezza. Lo scheletro è ora conservato presso il Museo Civico di Storia Naturale di Milano. La diagnosi della specie è stata fatta sulla base della letteratura e delle caratteristiche generali dello scheletro, ed in particolare grazie alle misurazioni del cranio e della mandibola confrontate con misure di riferimento desunte da altri esemplari della stessa specie conservati in Musei stranieri e Zifidi di altre specie conservati in diverse collezioni italiane. Finora non era stato descritto alcun spiaggiamento o avvistamento di mesoplodonte di Gervais nel Mediterraneo. Specie simili, come il mesoplodonte di Blainville, *Mesoplodon densirostris* (Blainville, 1817) e il mesoplodonte di Sowerby, *Mesoplodon bidens* (Sowerby, 1804), erano già state avvistate al largo o rinvenute spiaggiate lungo le coste spagnole, francesi, italiane e greche. In questa nota gli spiaggiamenti di queste specie vengono esaminati sulla base della letteratura di riferimento. La possibilità che altri mesoplodonti di Gervais siano stati in passato classificati come Zifidi diversi viene discussa.

Parole chiave: Cetacea, mesoplodonte di Gervais, *Mesoplodon europaeus*, Ziphiidae, Mediterraneo, Italia, spiaggiamenti.

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On August 9, 2001, a medium-sized beaked whale (4.5 meters long) stranded alive along the coasts of the northern Tyrrhenian Sea, near Castiglioncello (Livorno, Tuscany, Italy). The whale showed distress and all medical efforts to alleviate its condition had only partial success. The following morning the whale was towed in high waters, but the animal unfortunately died soon afterwards. The body was immediately recovered by military SCUBA divers and brought back to the coast. During this phase of the stranding, the animal was identified by the rescue team as a female Cuvier's beaked whale, *Ziphius cavirostris* (G. Cuvier 1812), a rather common species in the Italian waters of the Mediterranean Sea (Notarbartolo di Sciarra & Demma, 1994). Samples of several organs were collected immediately after death and formalin-fixed or frozen to be delivered to the *Mediterranean marine mammal tissue bank* located at the University of Padua. Frozen samples were then delivered to the Department of Environmental Biology of the University of Siena.

The whale carcass was grossly dissected for skeletal preservation and a few days afterwards finally collected by personnel of the Museum of Natural History of Milan, transported to Milan and frozen. In due time the skeleton was further cleaned and prepared for the Museum collections (catalog n. MSNM Ma7275). No specific urgency was put on the process, as the animal was at this point still identified as a female *Ziphius cavirostris*. The relative high frequency of this species in the national waters is confirmed by the number of recovered specimens in the Italian Museums of Natural History (Cagnolaro, 1996). However, routine examination of the cleaned skull immediately revealed that the animal could not possibly belong to the genus *Ziphius* and the initial identification was proven wrong. Characteristics of the skull and mandible, namely the shape and position of the teeth (see detailed description below) were indicative of a specimen belonging to the genus *Mesoplodon*. Tentative identification was made with one of the following *Mesoplodon* species: *Mesoplodon bidens* (Sowerby, 1804) (Sowerby's beaked whale), *M. densirostris* (Blainville, 1817) (Blainville's beaked whale) or *M. europaeus* (Gervais, 1855) (Gervais' beaked whale). The first two species were considered mostly because stranded animals belonging to these species had already been reported in the Mediterranean waters of Spain, Greece and Italy (see below). Anecdotal evidence further supported the presence of these elusive species. On the other hand, no strandings or sightings of *Mesoplodon europaeus* have ever been described this side of the Gibraltar Strait. In fact, the spotting of Gervais' beaked whales closest to the Mediterranean Sea have occurred in the British Channel Sea waters, the Canary Islands and West Africa (Vonk & Martel, 1988; Mead, 1989; Robineau & Vely, 1993; MacLeod, 2000; Norman & Mead, 2001).

However, careful examination of the skull and mandible, review of the litera-

ture (Flower, 1878; Van Beneden & Gervais, 1880; True, 1910; Raven, 1937; Rankin, 1956; Moore & Wood, 1957; Moore, 1960; Robineau, 1995), comparison of specimens of other *Mesoplodon* species maintained in the Italian Museums of Natural History and consultation with specialists belonging to foreign Institutions, clearly indicated that the specimen was an adult female *Mesoplodon europaeus*. The most specific diagnostic keys were indeed the shape and position of the teeth.

The skull and the mandible of the animal are shown in Figs. 1 and 2, respectively. A single pair of teeth was present in the mandible, approximately 9.5 cm from the tip of the mandible. The teeth were only partially erupted from the bone alveolus, and hidden (or at least barely visible) in the live animal. The condylobasal length was 71.5 cm. A few key measurements of the mandible are reported in Table 1.

Tab. 1 - Mandible measurements.

Tab. 1 - Misurazioni della mandibola.

	cm	
Length of symphysis	12.1	
Tip to anterior alveolar margin	R 8.1	L 8.0
Tip to posterior alveolar margin	R 10.9	L 11.0
Posterior symphysis to condyle	R 48.1	L 48.2
Length of a hemi-mandible (tip to condyle)	R 60.1	L 60.1
Condyle to condyle	30.0	
Alveolar length	R 3.1	L 3.2

The measurements reported in Table 1 were consistent with data kindly forwarded by Drs. D. Allen and J. Mead of the Smithsonian Institution, National Museum of Natural History in Washington, D.C. (U.S.A.) and derived from specimens of *Mesoplodon europaeus* (Allen and Mead, personal communication).

All bone sutures appeared fused and ossified, indicating that the specimen described here was well beyond puberty.

This report is the first description of a Gervais' beaked whale in the Mediterranean Sea. Strandings or sightings of beaked whales, although never frequent, have been described many times. Remains of Cuvier's beaked whales are kept in many museums of natural history of the Mediterranean seashore (Podestà *et al.*, 2005). As an example, in 2001, three Cuvier's beaked whales were recovered from Italian Tyrrhenian waters (Centro Studi Cetacei, 2003). On the contrary, as we noted above, the presence of specimens of the genus *Mesoplodon* in the

Mediterranean Sea is quite erratic (Van Bree, 1975). A Blainville's beaked whale stranded along the Spanish coasts was described by Casinos & Filella (1981). A (supposedly) Sowerby's beaked whale has been reported along the Italian Tyrrhenian coasts in 1928 (Brunelli & Fasella, 1928). Unfortunately, clear-cut identification of this specimen is missing, since the animal was later destroyed. Anecdotal evidence reports the presence of two beaked whales stranded alive and subsequently released along the coasts of the French Riviera (Notarbartolo di Sciara, personal communication; Van Canneyt *et al.*, 1998). These whales belonged to the genus *Mesoplodon*, but no further identification was possible based on the collected evidence. Another Sowerby's beaked whale stranded in the Aegean waters in 1989 (Drougas & Komnenou, 2001), but no skeletal or other bodily evidence has been recovered. On the other hand, a stranded Cuvier's beaked whale was erroneously identified as a *Hyperoodon bidens* (= *Mesoplodon bidens*) in 1900 in the Ligurian Sea (Italian northern Tyrrhenian waters) (Mezzana, 1900). The skull of this specimen is stored in the Museum of Natural History of Calci (Pisa, Italy) and it clearly belongs to a specimen of *Ziphius cavirostris* (Cagnolaro, 1996). Specimens of *Mesoplodon sp.* are stored in several Italian Museums of Natural History, however all these specimens are of exotic origin and were imported to Italy from non-Mediterranean waters for museal purposes in the past.

What we report here is therefore the first record of the presence of a Gervais' beaked whale in the Mediterranean Sea.

The skeleton is currently under restoration, and its detailed morphology will be described in a future study. As we noted above, several viscera belonging to the whale we describe are maintained at the *Mediterranean marine mammal tissue bank* of the University of Padua (see database at <http://www.sperivet.unipd.it/tissuebank/index.html>) and are available to the scientific community for further study.

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This is Centro Studi Cetacci work n. 107.



Fig. 1 - *Mesoplodon europaeus* (Museum of Natural History of Milan, specimen MSNM Ma7275). Skull: a) lateral view; b) dorsal view. (Photo: V. Fogato).

Fig. 1 - *Mesoplodon europaeus* (Museo Civico di Storia Naturale di Milano, esemplare MSNM Ma7275). Cranio: a) veduta laterale; b) veduta dorsale. (Foto: V. Fogato).



Fig. 2 - *Mesoplodon europaeus* (Museum of Natural History of Milan, specimen MSNM Ma7275). Mandible: a) lateral view; b) dorsal view. (Photo: V. Fogato).

Fig. 2 - *Mesoplodon europaeus* (Museo Civico di Storia Naturale di Milano, esemplare MSNM Ma7275). Mandibola: a) veduta laterale; b) veduta dorsale. (Foto: V. Fogato).

References

- Brunelli G. & Fasella G., 1928 - Su di un rarissimo Cetaceo spiaggato nel litorale di Nettuno. *Rend. Acc. Lincei*, 6 (7): 85-87.
- Cagnolaro L., 1996 - Profilo sistematico e tipologico delle raccolte di Cetacei attuali dei Musei italiani. *Museol. sci.*, XIII, suppl. Atti 10° Congresso A.N.M.S. Bologna 1994: 193-212.
- Centro Studi Cetacei, 2003 - Cetacei spiaggiati lungo le coste italiane. XVI. Rendiconto 2001. *Atti Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano*, 144/2003 (I): 151-166.
- Casinos A. & Filella S., 1981 - Notes on Cetaceans of the Iberian coasts: IV. A specimen of *Mesoplodon densirostris* (Cetacea, Hyperoodontidae) stranded on the Spanish Mediterranean littoral. *Saugetierkd. Mitt.*, 29 (4): 61-67.
- Drougas A. & Komnenou A., 2001 - Strandings and Sightings Databank from 1945-today. Technical Report of ARION – *Cetacean Rescue & Rehabilitation Research Center for the CITES Management Authority - Ministry of Agriculture*, Athens, Greece, Athens.
- Flower W. H., 1878 - A further contribution to the knowledge of the ziphioid whales. Genus *Mesoplodon*. *Trans. Zool. Soc. London*, 10: 415-437.
- MacLeod C. D., 2000 - Review of the distribution of *Mesoplodon* species (order Cetacea, family Ziphiidae) in the North Atlantic. *Mammal Review*, 30: 1-8.
- Mead J. G., 1989 - Beaked whales of the genus *Mesoplodon*. In: Handbook of Marine Mammals, vol. 4: River Dolphins and Larger Toothed Whales. Ridgway S. H. & Harrison R. (eds.). *Academic Press*, London: 349-430.
- Mezzana N., 1900 - Sulla cattura di un *Hyperoodon bidens* Flem. nel Mare Ligustico. *Bollettino del Naturalista*, 20 (11): 121-122.
- Moore J. C., 1960 - New Records of the Gulf-Stream Beaked Whale, *Mesoplodon gervaisi*, and Some Taxonomic Considerations. *Amer. Mus. Novitates*, 1993: 1-35.
- Moore J. C. & Wood F. G. Jr., 1957 - Difference between the beaked whales *Mesoplodon mirus* and *Mesoplodon gervaisi*. *Amer. Mus. Novitates*, 1831: 1-25.
- Norman S. A. & Mead J. G., 2001 - *Mesoplodon europaeus*. *Mammalian Species*, 688: 1-5.
- Notarbartolo di Sciara G. & Demma M., 1994 - Guida dei Mammiferi Marini del Mediterraneo. *Franco Muzzio Ed.*, Padova.
- Podestà M., D'Amico A., Pavan G., Drougas A., Komnenou A. & Portunato N., 2005 - A Review of *Ziphius cavirostris* G. Cuvier, 1823 Strandings in the Mediterranean Sea. *Journal of Cetacean Research and Management*, submitted.
- Rankin J. J., 1956 - The structure of the skull of the beaked whale, *Mesoplodon gervaisi* Deslongchamps. *Jour. Morph.*, 99 (2): 229-258.
- Raven H. C., 1937 - Notes on the anatomy and osteology of two species of *Mesoplodon* (*M. europaeus* Gervais, *M. mirus* True). *Amer. Mus. Novitates*, 905: 1-30.

- Robineau D., 1995 - *Mesoplodon europaeus* (Gervais, 1855) – Gervais-Zweizahnwal. In: Handbuch der Säugetiere Europas, 6/I B: Whale und Delphine 2. Robineau D., Duguy R. & Klima M. (eds.). AULA-Verlag, Wiesbaden: 583-594.
- Robineau D. & Vely M., 1993 - Stranding of a specimen of Gervais beaked whale (*Mesoplodon europaeus*) on the coast of West Africa. *Marine Mammal Science*, 9: 438-440.
- True F. W., 1910 - An account of the beaked whales of the family Ziphiidae in the collection of the United States National Museum, with remarks on some specimens in other American museums. *Bull. U.S. Natl. Mus.*, 73: 1-89.
- Van Beneden M. P. J. & Gervais P., 1880 - Ostéographie de cétacés vivants et fossiles. *Berthrand*, Paris, Atlas, 64 tavv.; texte: VIII + 634 pp.
- Van Bree P. J. H., 1975 - On the alleged occurrence of *Mesoplodon bidens* (Sowerby, 1804) (Cetacea, Ziphiioidea) in the Mediterranean. *Ann. Mus. Genova*, 50 (3): 226-228.
- Van Canneyt O., Dabin W. & Collet A., 1998 - Synthèse sur les Mammifères marins échoués sur le Littoral Français de 1992 à 1996. *CRMM - Institut de la Mer et du Littoral - La Rochelle*: 1-18.
- Vonk R. & Martel V. M., 1988 - First list of odontocetes from the Canary Islands. *European Research on Cetaceans*, 2: 31-35.

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